DOCUMENT RESUME

ED 281 738 SE 047 932

AUTHOR Grice, Michael
TITLE Portland Mathematics, Engineering, Science Achievement (MESA) Evaluation Report, 1986-1987.
INSTITUTION Portland Public Schools, OR. Research and Evaluation Dept.
PUB DATE Apr 87
NOTE 59p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Academic Achievement; Career Exploration; College School Cooperation; *Enrichment Activities; *Ethnic Groups; Mathematics Instruction; Middle Schools; *Minority Groups; Motivation; *Program Descriptions; *School Business Relationship; Science Careers; Science Instruction; Secondary Education; Secondary School Mathematics; Secondary School Science
IDENTIFIERS *Oregon (Portland)

ABSTRACT

The Portland Mathematics, Engineering, Science Achievement (MESA) program was designed to remedy the underrepresentation of particular ethnic groups in mathematics and science-based careers and professions. It provides enrichment instruction on a weekly basis in eight middle schools and three high schools to enhance mathematics and science skills and direction in career exploration. The 331 students who were in the second year of the program expressed high regard for the program. Virtually all were enrolled in mathematics and science courses; the participants were 42% African-American, 54% female, and 85% in middle schools. Developed collaboratively between the Portland Public Schools and Portland State University, the program is supported by business and industry, including provision for guest speakers, site visits, mentorships, and internships. Expansion of the project resulted in a decline of the percentage of underrepresented groups participating, because of the schools selected. Recommendations for future development of the program are given. Appendices include achievement data, a list of activities, incentives information, and questionnaire results. (MNS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED281738

1986-1987

EVALUATION REPORT

PORTLAND MESA

Mathematics, Engineering, Science Achievement

by Michael Grice

Research and Evaluation Dept.
Portland Public Schools
Portland, Oregon
Walter E. Hathaway, Director

April 1987

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Michael Grice

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SE 047 932

BEST COPY AVAILABLE

MESA EVALUATION REPORT
1986-87

TABLE OF CONTENTS

	PAGE
Executive Summary	1
MESA History	2
MESA Defined	2
MESA Rationale	3
The Goals and Implementation Strategy of Portland MESA	4
Figure 1.0: Organization Chart of the Portland-MESA Program	5
MESA Program Components	6
The Evaluation of Portland MESA	7
The Questions	8
Table 1.0: Portland MESA Enrollment Summary Totals and Percentages, 1986-87	9
Table 2.0: Portland MESA Enrollemnt Summary Totals and Percentages, 1985-86	10
Answering the Questions: The Findings	11
Table 3.0: Middle School Comparison of MESA Student Participation in Higher Level Mathematics Courses, 1985-86 and 1986-87	12
Table 3.1: Comparison of MESA Students' Participation in Higher Level Math as Eighth Graders in 1985-86 and as Ninth Graders in 1986-87	13
Table 3.2: Comparison of the Percentage of MESA Students' Participation in Higher Level Math and Science Courses in 1985-86 and 1986-87	13

Table of Contents (cont'd)

Table 4.0:
MESA Middle School Profiles, 1986-87..... 14

Table 4.1:
MESA High School Profiles, 1986-87..... 18

Table 5.0:
MESA Summer Enrichment, 1986: Enrollment..... 24

Table 6.0:
Percentage of Agreement and the Rank of the Item from the Results of the Identical Questionnaire One Year Ago..... 26

Table 6.1:
Items Indicating Least Agreement..... 26

Table 7.0:
Student Questionnaire Items with the Greatest Percentage of Agreement in 1986-87 and Percentage of Change from 1985-86..... 28

Table 7.1:
Student Questionnaire Items with the Least Agreement Among Respondents in 1986-87 and Percentage of Change from 1985-86..... 29

Conclusions..... 31

Recommendations..... 33

Appendices
A: Oregon State System of Higher Education Academic Performance Report, New Freshmen, 1985-86..... 34

B: Portland MESA List: Speaker Presentations, Technical Site Visits, Special Activities..... 37

C: Portland MESA Student Contract, Incentive Award Guidelines, MESA Point System..... 41

D: Percentages of Response Parent Questionnaire, Student Questionnaire, Percentages of Change - Student Questionnaire..... 45

E: Roster of MESA School Site Advisors 1986-87..... 51

MESA EVALUATION REPORT
1986-87

EXECUTIVE SUMMARY

The Portland Mathematics, Engineering, Science Achievement (MESA) program was designed to remedy the underrepresentation of particular ethnic groups in math and science-based careers and professions. Portland-MESA provides enrichment instruction on a weekly basis in eight middle schools and three high schools within the Portland district. The sessions offer enhancement in math and science skills and direction in career exploration. Frequently, guest speakers from business and industry present information which complements the academic activities and career guidance provided in the program.

The 331 middle school and high school students who have taken part in the second year of Portland-MESA express high regard for the program. In the aggregate, the MESA participants can be characterized as follows: virtually all are enrolled in math and science courses; the participants are 42.0% African American, 54.4% female, and 85% middle school age.

The program represents a unique collaboration between the Portland Public Schools and Portland State University. The infusion of formal support by business and industry has taken shape, and is currently manifest in guest speakers and site visits to business and industrial locations. "Mentorships" and longer-term "internships" have been established in the second year of the program and offer meaningful opportunities for students to experience the realities of work in specific fields.

In its brief tenure, Portland-MESA has been integrated into the regular activities of eleven public schools. It enjoys a high degree of acceptance among school principals as well as participants and their parents. Expansion of the project is an important consideration and merits careful assessment. In the fall of 1986, Benson High School along with Binnsmead, Kellogg, and Mt. Tabor middle schools joined the ranks of participating MESA program schools expanding the program from seven to eleven. The 21.7% decline in underrepresented group participation is directly related to the schools selected for 1986-87 expansion of the program and represents a departure from the original intent of the program.

Program continuity in terms of sustaining student participation and quality control is vital for optimum execution of Portland MESA goals. Selection and training of school site advisors is critical to the effective delivery of Portland MESA services. Long-range planning can now occur. It can be based on the experience, resources, procedures which have accrued to Portland MESA and which anchor the philosophical precepts that have guided its preliminary success.

MESA EVALUATION REPORT
1986-87

MESA History

The MESA Program began in Oakland, California in 1970 with 25 students. At present, there are more than 5,000 students enrolled in the program in California alone. MESA Centers are also operational in Arizona, Colorado, New Mexico, Utah, and Washington state.

Portland Public Schools and Portland State University joined forces to bring the MESA Program to the Portland School District as of July 1, 1985. It is currently in its second year of implementation in the Portland Schools. In Portland it has expanded from an initial five middle schools and two high schools to eight middle schools and three high schools in its second year.

MESA Defined

MESA was designed to increase the numbers of historically underrepresented minorities in mathematics, engineering, and science-related professions. Because such professions effectively attract a particularly small percentage of African Americans, Hispanics, and American Indians, Portland middle school and high school students from these ethnic backgrounds are the major target of the MESA program. The Portland MESA program, however, intends not to overlook any ethnic group in the pursuit of its goals.

Through MESA, participating students receive educational enrichment experiences and practical help needed to adequately prepare for university level coursework required for degrees in mathematics, engineering, and science-related fields. It is important to understand MESA as a support program which supplements classroom instruction and fortifies the career goals of today's young people. MESA enrichment classes and activities generally occur outside of the daily class schedule.

MESA Rationale

The Academic Performance Report of Freshmen in the Oregon State System of Higher Education (Appendix A) shows that African American, Hispanic American, and American Indian students entered college in the Fall of 1985-86 with SAT scores (both Math and Verbal) and high school GPA's consistently lower than other groups of entering freshmen students. Asian students' performance was far more favorable. In fact, they outscored all groups in math.

African American, Hispanic, and American Indians performed at a lower level during their freshman college year in Oregon institutions. Their collective mathematics GPA was below 2.00: African Americans 1.72; Hispanics Americans 1.97; and American Indian 2.14. Their collective science GPA during the first year of college was also below 2.0 at 1.92.

Clearly on the basis of these data, there exists a need for better preparation of ethnic minority populations for post-high school performance.

MESA is conceived as a powerful initiative for remedying this imbalance in performance with a well documented enrichment program for grades 6 through 12. A 1981 independent evaluation conducted by the Center for Study of Evaluation at the University of California, Los Angeles revealed that 1) MESA students performed significantly better than comparison groups; 2) MESA students' eligibility rates for admission to the University of California were significantly higher than the rate of other students; and 3) MESA was perceived as effective by coordinators, advisors, parents and students.

The rationale for the adoption of a Portland MESA program will influence the short term objectives of fortifying the skills level of students, and its success in the long term will influence where the student will ultimately land on the continuum of career and employment opportunities.

The joint sponsorship between Portland Public Schools and Portland State University is unique among previous MESA efforts, and stimulates the potential for the expansion of collaborative efforts between urban public school systems and institutions of higher education.

The Goals and Implementation Strategy of Portland MESA

The strategy for implementation is simple and direct. The MESA Program is assembled under the joint auspices of the local school district and a willing higher education institution. A team of professional educators is identified to deliver the services and work toward the achievement of MESA Program goals. The goals of Portland MESA are:

Goal I: To encourage students from the target populations to acquire the academic skills necessary to major in mathematics, engineering, and/or the sciences at a college or university.

Goal II: To promote career awareness so that participating students may learn of opportunities in the mathematics and science related professions early enough in their academic career to adequately prepare for professional training.

Goal III: To secure cooperation with MESA by secondary schools, universities, industry, engineering societies, and others providing various levels of vital human and fiscal resources helpful to the execution of MESA activities and goals.

Goal IV: To institutionalize the educational enrichment activities that prepare minority group students for engineering and other math and science-based careers through a demonstration of their utility.

Achievement of Portland MESA program goals is engineered by an experienced program coordinator, Renee Wilkerson, who serves as the key comptroller and director of student services. The coordinator is also the liaison between the schools, the sponsoring district, and the cooperating university.

The coordinator reports to Dr. Chik Erzurumlu, Dean of the School of Engineering and Applied Science, Portland State University and Dr. Ernest Hartzog, Assistant Superintendent, Portland Public Schools. Her responsibilities include the coordination of all the MESA activities in the program within the Portland District. As the day-to-day manager of the program, Ms. Wilkerson works closely with the "school-site advisors" at each school site and with the corporate, educational, and community groups that contribute human and fiscal resources to the program. She is assisted by Penny Fukui in coordinating site visits to technical and corporate sites and guest speakers in the schools which comprise the core of career activities.

Dr. Erzurumlu is the Director of Portland MESA and has responsibility for the operation of the MESA Center which is housed in the School of Engineering and Applied Science at Portland State University.

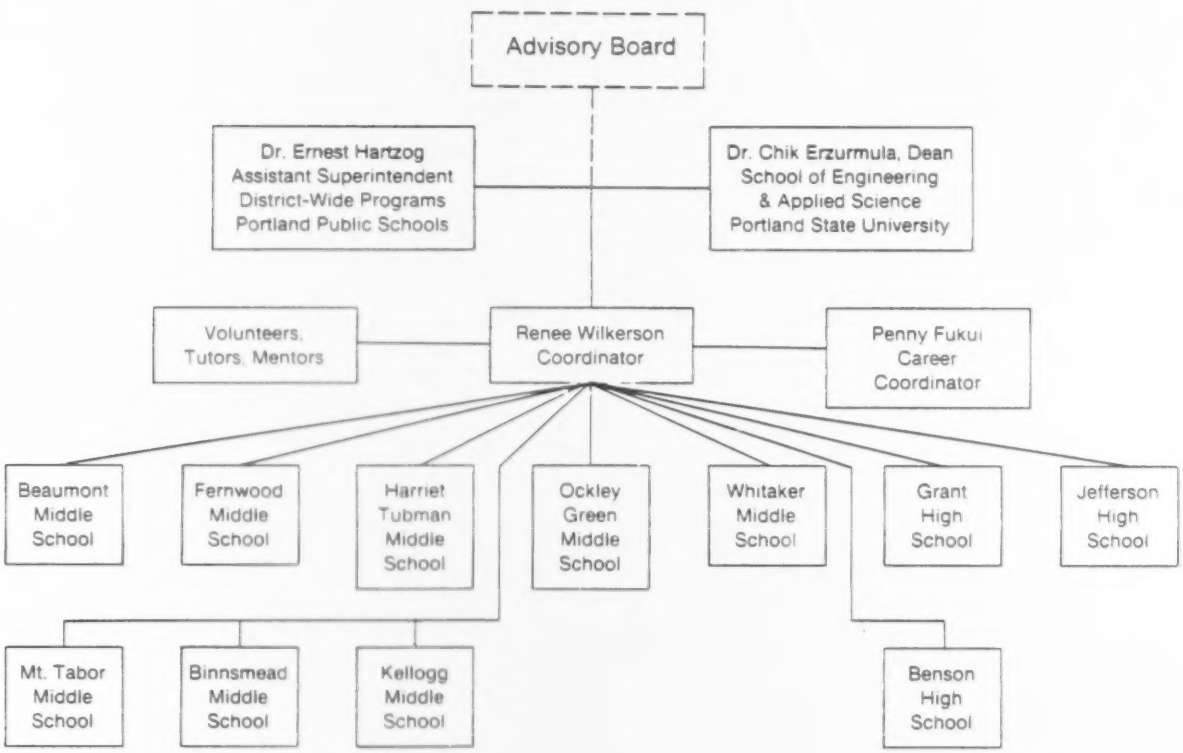
Dr. Hartzog is the Portland Public Schools' administrator in charge of MESA's operation in the Portland Schools. From his

initiatives and in concert with Dr. Erzurumlu, an Advisory Board comprised of representatives from industry, secondary schools, universities, and professional and community organizations, the MESA program benefits from input that guides improved program implementation and access to new resources.

The most critical unit of structure in the implementation of Portland MESA are the school site advisors. Each advisor is responsible for the coordination of activities at the school level. The Portland school sites include Beaumont, Binnsmead, Fernwood, Harriet Tubman, Kellogg, Mt. Tabor, Ockley Green, and Whitaker Middle Schools; and Benson, Grant and Jefferson High Schools. The advisor conducts the weekly enrichment sessions which may include instruction in math and science content or presentations by guest speakers. The advisor maintains all records on MESA student participation, and manages the incentive award points that accrue to each student on the basis of participation and completing special projects.

Figure 1.0

ORGANIZATION CHART OF PORTLAND MESA



MESA Program Components

The Portland-MESA program provides the following activities as the core effort toward the attainment of MESA goals:

Tutoring and Independent Study Groups

Study labs are established at each MESA school site. College students from the cooperating university and MESA Advisors provide assistance to MESA students in math and science homework. MESA students are also encouraged to work together in independent study groups.

Academic, University, and Career Advising

Special counseling is designed to assist MESA students select courses in the high school program, review requirements for college admissions, prepare college application forms, and draft resumes. Guest speakers are utilized to provide practical information about career opportunities and preparation.

Technical Site Visits (TSV)

MESA students are exposed to a variety of experiential learning activities. Such explorations provide direct contact with professionals working in research labs, engineering firms, technical production operations, computer centers, universities, and other technology intensive industries.

Summer Enrichment and Employment Project

During the summer months, MESA students are provided enrichment programs in mathematics and science. MESA students who have completed the 11th and 12th grades are offered meaningful job opportunities in engineering and technical industries.

Scholarship and Incentive Awards

Students who maintain 3.25 GPA in advanced level college preparatory mathematics, science, and English courses are eligible for scholarship support for post secondary work in specified fields.

Weekly Enrichment Sessions and Workshops

Each Portland-MESA school site holds a weekly meeting of MESA students. These after-school educational sessions, under the direction of the MESA advisors, focus on applied math and science learning activities and interaction with guest presenters. Workshops are held on Saturdays and focus on a broader range of activities including SAT preparation, special projects, and inter-scholastic math skills competition.

Parent Involvement

Parents are recognized as a most valuable resource in achieving MESA Program goals. Regular contact with parents through the MESA parent meetings and items like the MESA Contract help disseminate information and assure participation.

The Evaluation of Portland MESA

The evaluation of Portland MESA describes the structural and operational components of the program. It further analyzes the activities of the program in the context of program goals. Finally, it interprets and summarizes program data and information as a basis for making recommendations.

This report focuses on the comparisons between the inaugural year (1985-86) and the current year (1986-87).

Methods

The evaluation plan for Portland MESA is based on a set of questions designed to provide a comprehensive picture of Portland MESA. Sources for data and an appropriate method of data collection were identified for each question.

MESA records provide the source for baseline data on MESA participants. These data were reviewed for each participating school with attention given to sex, grade, and geo-cultural identity. Additional data provided by Management Information Services delineate math and science course participation and letter grade performance of MESA students. The monitoring of this data reflected in Tables 3 and 4 yield valuable program information as a measure of program health and goal attainment.

Each MESA school site, in conjunction with the Portland MESA office, produces an activity itinerary which serves to pinpoint dates for guest speakers, technical site visits, workshops and other various activities of the local school-site MESA chapter.

The perceptions of parents are key indicators of the value of the program. Through a questionnaire, parents were given an opportunity to report their perceptions about the program's efficacy.

A student questionnaire was developed to ascertain the program's effectiveness in providing information about math and science based career opportunities and the extent to which MESA students found participation worthwhile. Both parent and student questionnaires were administered in early February, 1986, and again in February, 1987 for the purpose of comparing data and isolating percentage differences in responses.

School personnel were interviewed for general comments. MESA Advisors at each school site and project staff were interviewed for their observations and suggestions. These comments and suggestions were incorporated into the 1986-87 implementation and continue as an on-going feature of the evaluation process.

The Questions

The questions from the evaluation plan trigger the evaluation process and provide a feedback loop. As answers are generated from acquired data, planning for program improvement can proceed with greater confidence.

The questions are:

1. Who is served by MESA?

2. To what extent are MESA students increasing their participation in higher level math and science courses?

3. To what extent is MESA providing career awareness opportunities in math, science, and engineering fields?

4. To what extent has MESA implemented components of the program; i.e. Tutoring and study groups; Academic and career advising; Technical Site Visits; Summer Enrichment and employment; Scholarship incentive awards; Workshops and weekly enrichment activities; Parent involvement?

5. To what extent do MESA students value their participation in the program?

6. To what extent is the community (parents, business & industry, PSU, etc.) aware of and supporting the goals of MESA by helping students increase their participation and increasing student awareness of career opportunities?

7. What are the perceptions of key program staff regarding the effectiveness of the program and its implementation? b) What are the suggestions of program staff for program improvement?

TABLE 1.0
PORTLAND MESA ENROLLMENT SUMMARY
TOTALS AND PERCENTAGES 1986-87

	M	F	Total	American Indian	European American	African American	Asian American	Hispanic American	GRADE LEVEL 6	7	8	9	10	11	12	Total
Beaumont	19	7	26	0	11	15	0	0	4	11	11	-	-	-	-	26
Binnsmead*	26	18	44	0	28	3	11	2	3	26	15	-	-	-	-	44
Fernwood	14	14	28	0	16	12	0	0	7	14	7	-	-	-	-	28
Kellogg*	15	22	37	1	30	0	5	1	5	21	11	-	-	-	-	37
Mt. Tabor*	21	14	35	0	26	3	4	2	15	14	6	-	-	-	-	35
Ockley Green	3	17	20	1	4	15	0	0	1	9	10	-	-	-	-	20
Harriet Tubman	19	31	50	0	17	25	2	6	9	25	16	-	-	-	-	50
Whitaker	17	23	40	2	5	29	4	0	7	26	7	-	-	-	-	40
Benson*	5	8	13	0	1	11	1	0	-	-	-	7	4	2	0	13
Grant	5	11	16	0	1	15	0	0	-	-	-	6	4	1	5	16
Jefferson	5	13	18	1	5	9	2	1	-	-	-	4	7	3	4	18
Independent*	2	2	4	0	1	2	0	1	-	-	1	3	-	-	-	4
Total 1987	151	180	331	5	145	139	29	13	51	146	84	20	15	6	9	331
Percentages	45.6	54.4		1.5	43.8	42.0	8.8	3.9	15.4	44.1	25.4	6.0	4.5	1.8	2.7	
Total 1986	70	139	209	14	46	136	5	8	21	60	60	18	13	17	0	209
Percentages	33.5	66.5		7.0	22.3	65.1	2.5	3.8	10.1	28.8	28.8	8.8	6.2	8.2	-	

* Note: Schools not included in 1985-86 data.

1390E

TABLE 2.0 PORTLAND-MESA ENROLLMENT SUMMARY
TOTALS AND PERCENTAGES OF GRADE, ETHNICITY AND SEX BY SCHOOL AND PROGRAM
1985-86

	M	F	Asian American	African American	European American	American Indian	Hispanic American	GRADE LEVEL 6	7	8	9	10	11	12	Total
Beaumont	13	18	2	17	12	0	0	8	18	5	NA				31
Fernwood	10	20	3	16	10	0	1	10	12	8	NA				30
Ockley Green	7	22	2	16	7	1	3	2	16	11	NA				29
Tubman	13	22	1	22	8	4	0	7	11	17	NA				35
Whitaker	13	23	1	32	0	0	3	4	13	19	NA				36
Grant	5	18	2	17	3	0	1	NA	NA	NA	10	7	6		23
Jefferson	9	16	3	16	6	0	0	NA	NA	NA	8	6	11		25
Total	70	139	14	136	46	5	8	31	70	60	18	13	17		209
Total %	33.5	66.5	6.7	65.1	22.0	2.4	3.8	14.8	33.5	28.7	8.6	6.2	8.1		100%

Answering the Questions: The Findings

Question #1: Who is served by MESA?

Comparisons of pertinent data from 1985-86 with that of 1986-87 yield information about the status of Portland MESA and provide a basis for observing the direction and the evolution of the program.

The evaluation of MESA necessarily involves the review of similar categories of data from the previous year for purposes of making comparisons between the 1985-86 and 1986-87 operations. A review of school-site enrollment and percentages relating to sex, grade, and ethnicity were examined. These data reveal a statistical composite of the Portland MESA program (Table 1.0). Although few conclusions can be drawn from the enrollment data, the comparison with 1985-86 data (Table 2.0) offers evidence of change and a clearer picture to answer the research question "Who is served by MESA?".

The addition of three middle schools and a single high school in 1986-87 added a net 122 students to the ranks of Portland MESA program participants. The total MESA enrollment grew from 209 in 1985-86 to 331 in 1986-87 (+37.0%).

The percentage of non-minority students increased from 22.3% in 1985-86 to 43.8% in 1986-87. African American students experienced the biggest swing in percentage from 65.1% in 1985-86 to 42.0% in the current year. This is attributable to the expansion of program sites from five middle schools and two high schools to eight middle schools and three high schools. Additional schools include Binnsmead, Kellogg, and Mt. Tabor where non-minority enrollment in MESA represents 64%, 84%, and 75% respectively.

Female student enrollment has become more balanced in this the second year of operation. Proportionately, male participation in MESA has increased from 33.5% in 1985-86 to 45.6% in 1986-87. The shift in male/female ratio appears to have resulted purely from the expansion to additional middle schools. The high school male/female ratio is nearly unchanged. However, the percentage of high school students in MESA overall has dropped from 32.3% in 1985-86 to 15.1% in 1986-87. This is due to the lack of increase in participant numbers in the high school compared to the increase in middle school participation. The largest increase occurred in the 7th grade population - up from 60 7th graders to 146 this year.

Question #2: To what extent are MESA students increasing their participation in "higher level" math and science courses?

For purposes of this report "higher level" math refers to all courses beyond basic mathematics (i.e. pre-algebra, algebra,

geometry, etc.) "Higher level" science refers to courses beyond general science or physical science where offered in the middle schools and high school curriculum.

A school by school review of MESA student course performance data yields information about the status and progress of middle school and high school MESA students in earning passing grades in higher level math and science classes.

The middle school program offers little variety in advanced math courses, and even less in advanced science classes. The number of students taking advanced math and science at the middle school level is small. Small numbers preclude meaningful comparisons. Science for most middle school students, including MESA participants, is customarily scheduled for only a single semester during the year for most middle school students. This explains a portion of the "missing" data that appear in Table 4.0 The other missing data represent grades that were not available for the report.

Middle school participation in MESA has doubled with the addition of three schools. As a matter of MESA Program policy, all participants must be enrolled in math and science courses. The structure of the curriculum in the middle school obviates that precept with regard to science. It is offered only one semester for most students. Semester math courses contribute similarly to the category "missing" data in tracking the participation and performance of MESA students in courses. Other missing data is attributed to unreported or unobtainable information.

Table 3.0
Middle School Comparison of MESA Student Participation in Higher Level Mathematics Courses, 1985-86 and 1986-87.

Beaumont -	1985-86	1986-87
Pre-Algebra/Algebra/ Geometry participation	12.9%	12.0%
Fernwood -	1985-86	1986-87
Pre-Algebra/Algebra/ Geometry participation	16.6%	7.1%
Ockley Green	1985-86	1986-87
Pre-Algebra/Algebra/ Geometry participation	27.6%	10.0%
Harriet Tubman -	1985-86	1986-87
Pre-Algebra/Algebra/ Geometry participation	5.7%	14.0%
Whitaker -	1985-86	1986-87
Pre-Algebra/Algebra/ Geometry participation	22.2%	2.6%

These data are simple in that they tell only what percentage of MESA students in a given school participated in higher level math courses in successive years. Table 3.0 does not report the progress of student groups moving from one level to the next higher level, but does reveal yearly rates of participation for each school.

Increases in MESA student participation in higher level math classes as indicated by the Harriet Tubman data, may suggest sound preparation of students in 6th and 7th grade. However, capable students who elect to enroll in MESA may also effect this outcome. Conversely, an indicated decrease in the number of students enrolled in higher level math may only reflect the void left by students moving on to high school, or may be the result of a smaller pool of students prepared for "higher level" math. It does not automatically suggest a program deficiency.

When MESA students are followed from year to year the data show ninth grade MESA students in 1986-87 reflecting a more consistent pattern when compared with prior year participation of MESA eighth grade students in higher level math from the 1985-86 year (Table 3.1).

Table 3.1
Comparison of MESA students' participation in higher level math as eighth graders in 1985-86 and as ninth graders in 1986-87.

MESA 8th grade students in higher level math 1985-86:	MESA 9th grade students in higher level math, 1986-87:
40.0%	75.0%

Table 3.2
Comparison of the percentage of MESA students' participation in higher level math and science courses in 1985-86 and 1986-87.

Percentage of all MESA high school students in higher level math, 1985-86	Percentage of all MESA high school students in higher level math, 1986-87
79.2%	80.0%
Percentage of all MESA high school students in higher level science, 1985-86	**Percentage of all MESA high school students in higher level science, 1986-87**
43.8%	58.0%

The data that follow reveal a more detailed picture of each participating MESA school with regard to courses, student enrollment and performance by grade. Enrollment and performance by sex and ethnic group was not generated.

Table 4.0
MESA Middle School Profiles, 1986-87

Beaumont Middle School		Course Grade				Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Mathematics	21	6	7	7	1	3	10	8
Algebra	3	1	1	1	0	0	0	3
Totals	**24**	7	8	8	1	**3**	**10**	**11**
Missing	1	-	-	-	-	0	1	0

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science	2	1	0	1	0	2	0	0
Gen. Science	5	3	1	1	0	0	5	0
World of Sci.	3	2	1	0	0	0	0	3
Marine Biology	3	2	1	0	0	0	0	3
Totals	**13**	**8**	**3**	**2**	**0**	**2**	**5**	**6**
Missing	12	-	-	-	-	1	6	5

Binnsmead Middle School		Course Grade				Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Math 6	2	0	1	1	0	2	0	0
Math 7	19	1	7	9	2	1	18	0
Math 8	11	1	8	0	2	0	0	11
Adv. Math 7	4	1	1	2	0	0	4	0
Algebra	4	3	1	0	0	0	0	4
Totals	**39**	**6**	**18**	**12**	**4**	**3**	**22**	**15**
Missing	1	-	-	-	-	0	1	0

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science	1	0	0	1	0	1	0	0
Science 7	14	2	2	7	3	1	13	0
Science 8	10	4	3	1	2	0	0	10
Totals	**25**	**6**	**5**	**9**	**5**	**2**	**13**	**10**
Missing	15	-	-	-	-	1	9	5

Fernwood Middle School		Course Grade				Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Math 6	2	0	1	0	1	2	0	0
Math 7	6	0	5	1	0	0	6	0
Math 8	6	0	1	5	0	0	0	6
Math Enrichmt	3	3	0	0	0	0	2	1
Adv. Math 6	3	1	1	1	0	3	0	0
Adv. Math 7	4	3	1	0	0	0	4	0
Geometry	2	2	0	0	0	0	2	0
Totals	**26**	**9**	**9**	**7**	**1**	**5**	**14**	**7**
Missing	2	-	-	-	-	2	0	0

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science 7	6	1	3	2	0	0	6	0
Science 8	2	0	2	0	0	0	0	2
Science/Health	5	2	3	0	0	5	0	0
Totals	**13**	**3**	**8**	**2**	**0**	**5**	**6**	**2**
Missing	15	-	-	-	-	2	8	5

Kellogg Middle School		Course Grade					Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	"F"	6	7	8
Math SK/AD/BA	14	2	2	6	1	3	0	14	0
Math BA/AD	5	2	2	1	0	0	0	0	5
Algebra	2	0	1	0	1	0	0	0	2
Totals	**21**	**4**	**5**	**7**	**2**	**3**	**0**	**14**	**7**
Missing	15	-	-	-	-	-	5	6	4

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science 7	10	2	3	3	2	0	10	0
Science 8	6	5	1	0	0	0	0	6
Science 7/8	1	1	0	0	0	0	1	0
Plant Science	0	0	0	0	0	0	0	0
Totals	**17**	**8**	**4**	**3**	**2**	**0**	**11**	**6**
Missing	18	-	-	-	-	5	9	4

Mt. Tabor Middle School	Course Grade				Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Math 6	11	0	6	4	1	11	0	0
Math 7	11	1	2	6	2	0	11	0
Math 8	6	4	0	1	1	0	0	6
Totals	**28**	**5**	**8**	**11**	**5**	**11**	**11**	**6**
Missing	5	-	-	-	-	4	1	0

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science 7	5	2	2	1	0	0	5	0
Science 8	4	1	0	3	0	0	0	4
Science/Health	11	3	4	4	0	11	0	0
Totals	**20**	**6**	**6**	**8**	**0**	**11**	**5**	**4**
MIssing	13	-	-	-	-	4	7	2

Ockley Green Middle School	Course Grade				Grade Level		
Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
7 Math 7	6	1	0	4	2	0	7	0
8 Math	7	0	2	4	0	0	0	7
8 Math 8-7	1	0	1	0	0	0	0	1
Pre-Algebra	1	0	1	0	0	0	0	1
Algebra	1	1	0	0	0	0	0	1
Totals	**16**	**2**	**4**	**8**	**2**	**0**	**7**	**10**
Missing	4	-	-	-	-	1	1	1

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
7 Science	7	4	1	0	2	0	7	0
8 Science	9	3	5	1	0	0	0	9
Science	1	0	1	0	0	0	1	0
Totals	**17**	**7**	**7**	**1**	**2**	**0**	**8**	**9**
Missing	3	-	-	-	-	1	1	1

Harriet Tubman Middle School — Course Grade / Grade Level

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Math 6 E/S	9	2	3	4	0	9	0	0
Math 7 B/E/S	23	5	9	8	0	0	23	0
Math 8 E/S	10	4	5	1	0	0	1	9
Algebra	6	4	1	1	0	0	1	5
Adv. Algebra	1	0	1	0	0	0	0	1
Totals	**49**	**15**	**19**	**14**	**0**	**9**	**25**	**15**
Missing	1	-	-	-	-	0	0	1

Course	Enrolled	"A"	"B"	"C"	"D"	"F"	6	7	8
Science 6	2	0	1	1	0	0	2	0	0
Earth Science	8	4	1	1	0	2	0	6	2
Physical Sci.	14	11	2	0	1	0	0	8	6
Totals	**24**	**15**	**4**	**2**	**1**	**2**	**2**	**14**	**8**
Missing	26	-	-	-	-	-	7	11	8

Whitaker Middle School — Course Grade / Grade Level

Course	Enrolled	"A"	"B"	"C"	"D"	"F"	6	7	8
Math	21	6	2	9	2	2	3	14	4
Algebra	1	0	0	1	0	0	0	0	1
Totals	**22**	**6**	**2**	**10**	**2**	**2**	**3**	**14**	**5**
Missing	16	-	-	-	-	-	4	10	2

Course	Enrolled	"A"	"B"	"C"	"D"	6	7	8
Science	16	6	3	4	3	0	11	5
Science/Health	2	1	1	0	0	2	0	0
Totals	**18**	**7**	**4**	**4**	**3**	**2**	**11**	**5**
Missing	20	-	-	-	-	5	13	2

In evaluating high school course performance data, "C" grades and above were considered as "passing" grades for comparisons of 1985-86 and 1986-87 data. Table 3.2 indicates a dramatic increase in participation at Grant and a slight decline at Jefferson. Benson High MESA students indicate a comparable participation, but no "increase" due to its first-year as a MESA school site.

More important may be the decline in total numbers of MESA participants at each site. MESA programs at Grant High and Jefferson High have 30.5% and 28% fewer participants respectively in 1986-87 than one year ago. The average high school chapter enrollment in 1985-86 was 24. In 1986-87 the average high school MESA chapter enrollment in the same schools is 17. Benson High in its first year has 13 students in the MESA program.

Both Grant High and Jefferson High lost their advisor at the end of the first year. New advisors were selected from the pool of available math and science teachers in MESA schools to manage the school site in 1986-87. The subsequent disruption of program continuity may have affected the enrollment and performance of MESA students participating in higher level math and science classes.

Table 4.1

MESA High School Profiles, 1986-87

Benson High School		Course Grade				Grade Level			
Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Geometry	4	0	2	2	0	1	2	1	0
Intro Alg. I	4	0	3	0	1	4	0	0	0
Intro Alg. II	2	1	0	1	0	0	2	0	0
Totals	10	1	5	3	1	5	4	1	0
Missing	3	-	-	-	-	2	0	1	0

Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Science 1-2	1	0	0	1	0	0	1	0	0
Science 3-4	1	1	0	0	0	0	0	1	0
Anatomy/Phys	3	1	1	1	0	0	3	0	0
Biology 1-2	3	0	0	2	1	3	0	0	0
Med. Biology	2	2	0	0	0	2	0	0	0
Totals	10	4	1	4	1	5	4	1	0
Missing	3	-	-	-	-	2	0	1	0

Table 4.1 (cont.)

Grant High School

A. MESA student enrollment:

1985-86: 23
1986-87: 16

B. Percentage of MESA students earning passing grades in other than grade level mathematics courses (Pre-Algebra, Algebra, Advanced Math, etc.):

1985-86: 52.2%
1986-87: 68.8%

C. Percentage of MESA students earning passing grades in other than grade-level science courses (Biology, Chemistry, Physics, Anatomy/Physiology, etc.):

1985-86: 8.7%
1986-87: 56.3%

Grant High School		Course Grade				Grade Level			
Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Algebra 1	6	5	1	0	0	4	1	1	0
Algebra 3	1	1	0	0	0	0	0	0	0
Business Math	1	1	0	0	0	0	0	0	1
Geometry	4	2	0	1	1	2	2	0	0
Math Analogies	1	0	0	1	0	0	0	0	1
Totals	13	9	1	2	1	6	3	1	2
MIssing	1	-	-	-	-	0	0	0	1

Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Biology	6	2	1	3	0	4	2	0	0
General Sci.	2	0	1	1	0	2	0	0	0
Physical Sci.	2	0	1	1	0	0	0	1	1
Physics	2	0	0	1	1	0	0	0	2
Anatomy/Phys.	2	1	0	1	0	0	0	0	2
Totals	14	3	3	7	1	6	2	1	5
Missing	0	-	-	-	-	0	0	0	0

Table 4.1 (cont.)

Jefferson High School

A. MESA student enrollment:

1985-86: 25
1986-87: 18

B. Percentage of MESA students earning passing grades in other than grade level mathematics courses (Pre-Algebra, Algebra, Advanced Math, etc.):

1985-86: 92.0%
1986-87: 83.3%

C. Percentage of MESA students earning passing grades in other than grade-level science courses (Biology, Chemistry, Physics, Anatomy/Physiology, etc.):

1985-86: 64.0%
1986-87: 55.5%

Jefferson High School		Course Grade				Grade Level			
Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Algebra 1-2	4	1	1	0	2	3	1	0	0
Algebra 3-4	5	2	0	2	1	0	2	2	1
Geometry	1	1	0	0	0	0	0	1	0
Honors Math	5	1	1	2	1	1	4	0	0
Math Seminar	2	0	1	1	0	0	0	0	2
Totals	17	5	3	5	4	4	7	3	3
Missing	1	-	-	-	-	0	0	0	1

Course	Enrolled	"A"	"B"	"C"	"D"	9	10	11	12
Physical Sci.	2	1	0	0	1	2	0	0	0
Life Science	1	0	1	0	0	0	1	0	0
Biology	2	1	1	0	0	0	1	1	0
Honors Biology	1	0	0	1	0	1	0	0	0
Chemistry	5	3	1	1	0	0	5	0	0
Physics	3	0	0	2	1	0	0	1	2
Totals	14	5	3	4	2	3	7	2	2
Missing	4	-	-	-	-	1	0	1	2

The long-range goal of the MESA Program is to have increasing numbers of underrepresented minorities completing more math and science course work during their public school sojourn. It is anticipated that students so participating will have the advantage of improved opportunity to succeed in securing access to quality education through preparedness; and equity in science and math-based careers by capitalizing on that preparedness. To the extent that students stay in MESA, which requires math and science enrollment through high school graduation, it follows that more challenging course work will attend individual student progress through the years.

In the near-term, MESA students improve their chances on college entrance exams, and have the advantage of closely monitored progress on the accumulation of credits toward graduation from high school.

The composite data in Table 4.1 show a general increase in the percentages of students who are taking algebra, geometry, and other "higher level" mathematics and a similar increase with regard to biology, chemistry, physics, and other "higher level" science courses.

Question #3: To what extent is MESA providing career awareness opportunities in math, science, and engineering fields?

Between mid-October,1986 and mid-March, 1987 the Portland MESA Program delivered 80 Guest Speaker Presentations, Technical Site Visits, and Special Activities for MESA students with an additional 26 planned before the end of April, 1987 (Appendix B). These activities are in addition to the instruction and learning activities provided by the school site advisors during the weekly enrichment sessions. Guest speaker presentations, TSV's and special activities are arranged and facilitated by the MESA program Career Coordinator, Penny Fukui.

The speaker presentations typically occur at the school site. A representative from business or industry accepts an invitation to visit the school, meets with the program Career Coordinator, and makes an appropriate presentation at the weekly MESA session. Presentations occur at middle school and high school sites and business locations.

The technical site visits resemble the common field trip, but are distinguished by more directed and purposeful encounters with the object environment. Visits to the Oregon Graduate Center to witness scientific research in progress and to Tektronix, Inc. for hands on experience with manufacturing equipment and to learn first-hand about the considerations and assumptions entertained in the course of technical design represent two of the kinds of experiences MESA students are provided.

A partial list of locations visited by MESA students includes: Coopers and Lybrand, Oregon Primate Center, Swan Island Shipyards, Horizon Airlines, Reed College Nuclear Reactor, Army Corps of Engineers, and IBM corporate facilities.

Technical site visits are typically arranged for individual MESA school groups. TSV's are also provided on a program-wide basis making specially targeted visitations available to interested MESA students across all chapters.

Through the scheduled technical site visits and speaker presentations, students practice asking prepared or specific questions about career categories, specific job titles, salary, qualifications, preparation, and skills that are needed for entry level positions and advancement. Students are required to write reports on each speaker and each technical site visit. Completed reports contribute to each students point totals at his/her MESA chapter. The accrual of points determine each MESA student's eligibility for participation awards and cash incentives.

The special activities include projects such as bridge building to emphasize engineering concepts. These activities are supported with technical site visits, but are geared to balance technical and science-related careers with familiarity and requisite preparation for engineering careers. Many of the activities are designed to acquaint students with the math skills and general preparation required for engineering jobs through hands-on/experiential learning.

Because the special activities often center around Portland State University, students are frequently exposed to the university campus. With college being the "gateway" to many of the careers introduced to students, that familiarity offers potential dividends in student self-esteem, college selection, and success rate in higher education. It may ultimately play a part in students selecting an Oregon school for higher education opportunities.

A considerable amount of time and resources are directed toward the exploration of and exposure to careers in mathematics, science, and engineering. The addition of staff in 1986-87 specifically for that purpose has significantly increased the number and quality of the career orientation experiences compared to the 1985-86 Portland MESA effort.

Question #4: To what extent has MESA implemented components of the program; i.e. Tutoring and study groups; Academic and career advising; Field trips; Summer enrichment and employment; Scholarship incentive awards; Workshops and weekly enrichment activities; Parent involvement?

Tutoring and study groups are made available at each MESA school site in addition to the weekly enrichment sessions. A

regularly scheduled time-slot is set aside at each school to offer tutorial support for MESA students. These tutoring and study sessions are part of an effort to assist MESA students with homework from regular math and science classes. The sessions are coordinated by the MESA office and typically engage college students and volunteers as tutors.

Changed from the first year's operation, the tutoring and study group sessions are held on a regularly scheduled basis. The scheduled weekly time-slot encourages better planning for students and parents, and makes it possible for a tutor to manage several schools whose study lab days are staggered. As the MESA program has grown and stabilized, the Portland MESA office stirs parents to supervise study sessions in their homes for clusters of MESA students.

Academic and career advising is closely tied to the Technical Site Visits and the Guest Speaker Presentations. Although individual student advising is available through mentoring or regular school counselors, the greatest proportion of academic and career advising takes place informally as part of the MESA chapter learning activities. Career information is passed from guest speakers to students in the form of direct experience by people employed in the fields of mathematics, science, and engineering. Academic advising is a built-in feature of the MESA program because all students are required to take math and science courses throughout their participation in the program. The biggest issue for students is not deciding what courses are appropriate, but timely scheduling so that needed courses can be taken in sequence or secured prior to being filled.

Often referred to as a "field trip" the MESA office decided to phase out that terminology in lieu of language that is more representative of the experience - **Technical Site Visitations.** This change in nomenclature is intended to communicate to the students, parents, and community that expectations are distinct from those associated with a "field trip". The litany of technical site visitations in Appendix B reveals an extensive and well distributed array of exposures to math and science based careers for both middle and high school students.

Summer Enrichment activities for Portland MESA were convened daily for six weeks in June and July of 1986. The program convened 54 6th, 7th, and 8th grade MESA students or 25.8% of the 1985-86 program. Classes were held at Portland State University and focused on skills in math and activities in science and engineering including computer education. Portland MESA plans a similar arrangement for summer 1987. The enrollment statistics for 1986 Portland MESA summer enrichment are listed in Table 5.0 below.

Table 5.0

MESA Summer Enrichment, 1986: Enrollment

Category	Enrolled	Percentage of 1985-86 MESA students
Male	24	44%
Female	30	56%
6th Grade	15	28%
7th Grade	19	35%
8th Grade	20	37%
African American	35	65%
American Indian	1	2%
Asian American	3	6%
European American	13	24%
Hispanic American	2	3%
Total	54	100%

Summer Enrichment for 1987 is similarly designed. However, 25% of the 1986-87 program projects an enrollment of 82 middle school students. Portland MESA will add a high school internship program which will be sponsored by Tektronix, Inc. The proposed program will offer employment to a limited number of students for the purpose of providing hands-on orientation to technical/scientific employment. The motivation for Tekronix, Inc. commitment and the long-range goal is that of grooming potential employees in the workplace environment. This kind of commitment is the direct result of the addition of a full-time career coordinator who has been successful in negotiating this model for corporate involvement.

Portland MESA encourages students to accept responsibility for learning. It supports independent study and makes tutorial resources available. The program has experimented with providing incentives for participation and scholarship as a means of stimulating and rewarding excellence. At the close of each semester, students are recognized for varying levels of performance with cash and prizes. The issue of responsibility is addressed through the "MESA Contract" (Appendix C) to which both student and parent subscribe.

The Portland MESA Point System and Incentive Award Guidelines (Appendix C) detail the criteria that is used by the program to reward effort, progress, and achievement in math and science classes. When MESA students earn A's or B's in math and/or science classes, without F's in any subject, they are eligible for Incentive Awards. The cash awards range from $2.00 for a "B" in middle school to $7.00 for an "A" in high school math or science courses.

Participation Awards are also given based on a cumulative point system at each school site. The Participation Awards come in the form of prizes such as record albums, drink mugs, etc. It is indeterminable from available data what effects the incentives have on student performance.

In June, 1986, at the end of the first year of MESA, the program issued 91 Incentive and Participation Awards representing 43.5% of all MESA students. At the conclusion of the first semester in 1986-87, 151 MESA students claimed Incentive and Participation Awards representing 45.6% of all MESA students. The Portland MESA office carefully monitors the scale of the awards to balance the value of the awards with "learning for learning's sake."

Parent involvement has been one of the difficult areas in public education. It is no less a challenge for the Portland MESA program. The 1985-86 MESA program arranged periodic parent gatherings at each of the MESA school sites as a means of acquainting the parents of MESA students with the program and activities. Each school had two meetings during 1985-86. A handful of parents typically showed up. While five or six parents at each school comprised a reasonable representation of working parents at a given school, it offered only a fragmented picture to MESA program staff, caused duplication of effort, and limited the exchange of ideas and information among parents.

The parent meetings were re-organized for 1986-87 by geographic area and grade level. That is, high school parents, middle school parents from N/N.E., and middle school parents from S.E. Portland schools met as working units. This consolidated meeting format has provided improved attendance and lively exchanges of ideas among parents.

An analysis of the parent survey (Appendix D) offers a limited perspective on parent views regarding Portland MESA and their children's involvement in the program. With only 14% of parents responding to the questionnaire, there are limits on the generalizability of the responses. However, the results from the parent questionnaire are listed below.

Table 6.0
Percentage of Agreement and the Rank of the Item from the Results of the Identical Questionnaire One Year Ago.

Item	Percentage of Agreement	Item Rank in 1985-86
MESA program adds brand new opportunities for my child.	100.0%	1
My child speaks positively about MESA.	95.5%	9
My children are glad to be part of MESA.	95.3%	2
More students should have a chance to participate in MESA.	95.0%	3
I encourage my child to participate in MESA.	91.3%	4
My child is aware of the benefits offered by MESA.	86.9%	12
MESA specifically helps my child know more about careers.	78.3%	5
MESA does a good job of linking students with business people.	78.3%	7

This table reflects substantial congruency in parent opinions from year one to the current year's operation. Parents perceive that MESA is doing a better job of informing students about the program and the benefits. In contrast, Table 6.1 reflects the items from the 1986-87 Parent Questionnaire with the least amount of agreement.

Table 6.1 - Items Indicating Least Agreement

Item	Percentage of Agreement
Most parents attend the MESA parent meetings.	35.3%
MESA is stimulating my child to study more often/regularly.	47.9%
I understand the structure of MESA coordinator, advisors, activities, etc.	52.4%
Encouraging my child is one main reason he/she continues in MESA.	56.6%

Attendance at parent meetings is a chronic problem in schools and programs. MESA is no exception. It is probable that improved attendance would ameliorate a portion of the general misunderstanding of the MESA structure expressed in the results. While a majority of parents surveyed indicate that MESA alone does not stimulate their child to study more, approximately 48% of MESA parents surveyed **do agree** that MESA is responsible for improved study for their children. The final item listed suggests that MESA students are continuing in MESA for reasons other than parent encouragement. This "self-motivated" claim is born out by 71.6% of student respondents on a similar questionnaire (Appendix C) who indicate that they are attending MESA for reasons other than compliance with parent preferences.

An incisive group discussion with 40 parents from the N./N.E. schools at a March 31, 1987 meeting offered valuable feedback. Parents responded to this summary of data from the parent questionnaire presented that evening by the evaluation department. Parents were uninhibited in expressing their concerns and perceptions about the 1986-87 Portland MESA.

The MESA Program was extremely well received for advancing the concept of science and mathematics among minority children. Parents credited MESA with improving the attitudes of their students with respect to math and science. They were very pleased with the MESA staff and the coordination of activities. However, they cited a need for a better system of getting information to parents. Numerous mailings were confusing them. Sometimes they would get material too near a deadline. They suggested that the "MESA Calendar" worked very well; that a simpler publication would serve them better than the detailed newsletter which includes student writings; and that the publication dates should be more limited so parents can better anticipate its arrival.

Parents expressed special concern about the flow of information from the school site advisors to the students. They complained that projects completed by students did not always get returned in a timely manner and discouraged students' participation. They asked that the school site advisors be more responsive to this issue.

Parents suggested "marketing" the MESA program to prospective students now in 5th and 8th grades as part of the recruitment process; and they praised the PSAT/SAT workshops that Portland MESA provides for high school students as appropriate.

The discussion concluded with parents initiating a structure for a more active parent advisory group. Parents stepped forward to take greater responsibility in effecting an active parent group. There was a recognition of the need for support in getting parents informed and to more regularly attend meetings.

A like meeting of parents from Binnsmead, Mt. Tabor, and Kellogg Middle Schools revealed similar views. Parents expressed satisfaction with the inclusion of the S.E. schools in the Portland MESA program. Penny Fukui reported that the S.E. parents had taken part in driving and supervision of students on selected site visits, and were calling other parents about the parent meeintgs.

Portland MESA now in S.E. middle schools will also require consideration as to the strategy for those students to continue in MESA if they elect to attend a non-MESA high school.

Question #5: To what extent do MESA students value their participation in the program?

An analysis of the student questionnaire data (Appendix E) reveal generally positive opinions from MESA students coupled with some interesting variances from the same questions asked of students in 1985-86. The survey was conducted at the end of the first semester in February, 1987. The percentage of returned questionnaires was better than 35% providing a good sample of MESA student feedback. Examining the level of agreement among students in Tables 7.0 and 7.1 offers insight on selected items.

Table 7.0

Student Questionnaire Items With the Greatest Percentage of Agreement in 1986-87 and Percentage of Change from 1985-86.

Item	% of agreement	% of change
My parents are pleased about participation in MESA.	98.9%	+1.4%
I plan to go to college	97.3%	-2.7%
Our guest speakers add to what the MESA program is trying to teach.	93.5%	+1.3%
I do have career goals.	92.6%	-4.6%
The MESA advisor at my school provides helpful instruction.	89.7%	-6.7%
I don't mind leaving school for a worthwhile field trip.	89.2%	-0.4%
MESA program gives me an advantage that I wouldn't have without it.	87.9%	+2.1%
MESA makes me more aware of careers than regular school courses.	87.7%	-1.8%

Table 7.1

Student Questionnaire Items With the Least Agreement Among Respondents in 1986-87 and Percentage of Change from 1985-86.

Item	% of agreement	% of change
My parents are the main reason I'm attending MESA.	28.4%	-12.2%
I think field trips reduce my learning when they are on school time.	29.7%	-6.9%
One thing that could help me with full participation is more personal counseling.	31.7%	-6.6%
Tutoring help is something I really need.	37.3%	-1.6%

Students seem to value their participation in the Portland MESA program. They express a strong affirmation of electing to participate in the program of their own accord; independent of their parents wishes. There is some distinction between responses of the high school participants and the middle school participants. However, all MESA students agree that the program makes them more aware of career opportunities, more aware of science-based careers (73.2%), and gives them more self-pride (72.1%). They readily recognize that learning can take place in places other than the classroom (~80%), and 85.5% indicate that they expect to continue in MESA "during all... high school years."

One indication of students valuing MESA is the 77.5% agreement among all students surveyed that they attend all MESA group sessions. This item represents the greatest percentage increase in agreement (+13.0%) among all items on the questionnaire. This may be attributed to the expansion of the program to new schools, and the attendant new enthusiasm for the program.

Question #6: To what extent is the community (e.g. parents, business & industry, P.S.U., etc.) aware of and supporting the goals of MESA by helping students increase their participation in MESA and increasing student awareness of career opportunities?

The list of Technical Site Visits (Appendix B) is an indication of the growing interest in the private sector to participate with the schools in cultivating tomorrow's worker. The discussion of parents suggests a strong interest in and satisfaction with MESA's efforts in exposing students to appropriate career paths. Portland State University stands alone among local colleges' demonstrated commitment to assist in advancing "underrepresented groups" toward broader options in training and employment.

However, the internship project with Tektronix, Inc. scheduled for the summer, 1987 is worth revisiting. They have established a corporate goal of "increasing the pool" of available minority employees by providing internships from nine to eighteen weeks for high school students. These are paid positions where students will be exposed to theory, skills, practice, environment, and work habits of professionals. Reed College, Portland, Oregon has expressed a similar "increasing the pool" goal, and is planning with MESA staff to implement it inside the coming 12 months.

Community support has been expressed through the mentoring component of Portland MESA. Students are permitted to "shadow" an employee for several shifts on the job as a means of acquainting the student with the job and several of the persons who carry out those jobs. Employers working with MESA in 1986-87 in the mentoring/shadowing experience include: U.S. Bank, U.S.Army Corps of Engineers, IBM, Reed College, Tektronix, Multnomah County District Attorney and several others. The list of companies and public agencies that provide guest speakers also show more than a cursory interest. The commitment to make a presentation in a school involves a pre and post interview in addition to making a presentation - sometimes for more than one school. The tasks of the Portland MESA program secretary, the Career Coordinator, the Program Coordinator, the School Site Advisors, and the Administrators as well as the advisory board are clear and operational.

Question #7: a) What are the perceptions of key program staff regarding the effectiveness of MESA and its implementation?
b) What suggestions are offered for program improvement?

Interviews with key staff persons yield a set of observations that are reasoned and sorted on their importance to having a viable program. A synthesis of the most prominent observations resides in the short list below:

1. Because Portland MESA is yet a new supplement for improving achievement with a targeted population, the goals of the program must be constantly revisited for planning and internal evaluation purposes.

2. Because the school site advisors are the most critical structural component of the program, strategies must be in place to monitor their role and provide support for the execution of the MESA philosophy among participants.

3. Because of the increased numbers of MESA students, and the broadened physical geography of the program, there is a commonly recognized premium on time management and quality communication between the Portland MESA office and the school sites.

4. Because of the range and number of activities at the school sites, at PSU, at various locations throughout the state, and for both middle school and high school students, well planned coordination is critical.

Inside these observations are the keys for a successful program: planning, training, team effort and versatility.

Program staff comment the they "love" their work because of the importance of their "mission" to accomplish MESA goals. They cite the challenge provided in attempting to deliver a quality product. The comments that spew from staff create a thematic quality that demands of each staff person commitment, energy, resourcefulness, competence and vision that matches the philosophy of MESA. It is a program which intends to make engineers, scientists, and mathematicians out of students who otherwise would not have those skills and career paths available.

Staff suggestions for an improved program reflect many of the sentiments of the parents: better communication between the offices of Portland MESA, the schools and the home; improved delivery of services by the school site advisors; increased numbers of volunteers for tutors and mentoring activities; strengthening of existing MESA school site chapters prior to further expansion; and improved scheduling of the written communication from the MESA office.

Conclusions

1. Enrollment in Portland MESA increased 37% in the second year of operation in the Portland Public Schools. That increase was due the expansion of the program to include three additional middle schools and one high school. The increase was attended by a decline in the enrollment of underrepresented groups by 21.5%.

2. The decrease of 21.5% in minority participation in Portland MESA suggests that the 1986-87 expansion represents a departure from some stated MESA goals.

3. The proportion of male to female participants improved from a 33 to 67 ratio to a 46 to 54 ratio in 1986-87.

4. The requirement of Portland MESA that participants be continuously enrolled in mathematics and science courses has implications for high school mathematics and science curricula. Whether successive year participation by MESA students in mathematics and science courses may exhaust courses currently available will have to be examined at MESA high schools.

5. It is likely that students who continue in MESA through high school will demonstrate higher achievement as measured by PSAT and SAT scores than comparable non-MESA students.

6. The probability of students electing to continue in the MESA Program through high school is high. 85.5% of all Portland MESA students indicated a willingness to do so. Better than 90% of MESA students and parents concur that students participate in MESA independent of parental pressure.

7. The addition of a full-time Career Coordinator has enabled more program contact with businesses and scientific/technical industry. Increased student contacts with role models, mentors, and institutions gives meaning to the language of math-based, science-based, and engineering careers.

8. The recognition of student effort and achievement in mathematics and science is as valuable as the specific awards and incentives provided by the program.

9. Parents and students alike are pleased with and report finding value in being associated in Portland MESA. Parents are eager to see parental involvement improve and indicate a willingness to establish an improved network of communication and participation by MESA parents.

10. The written communications that flow from the Portland MESA office are informative. However, they need to be better tailored to the parent audience with respect to timing, content, and ease of identifying deadline dates.

11. School site advisors remain as the single, most critical structural component of the MESA program. The success of MESA is largely dependent on the percentage of students that remain with the program from year to year. In each school where the advisor was lost or changed from 1985-86 to 1986-87: Beaumont and Ockley Green Middle Schools and Grant and Jefferson High Schools, enrollment declined. Unobtrusive data indicate that the background, experience, availability, and commitment to MESA goals are more important school site advisor characteristics than content area specialty.

Recommendations

1. Provide formal training for advisors which addresses the critical issues of program quality, continuity, and sustaining participation of students in Portland MESA.

2. Initiate a special recruitment effort annually to target underrepresented groups in grades five and eight apprising them of the possibilities of MESA participation.

3. Adjust two aspects of the selection process for school site advisors. Firstly, permit the program coordinator to effectively recommend school site advisors. Secondly, broaden eligibility criteria from science and math teachers to "certificated teachers."

4. Streamline the publications of the Portland MESA office to accommodate the needs of the program management and the input of parents with regard to timing, content, and deadline notification.

5. Restrict expansion of Portland MESA to additional chapters in existing schools prior to expansion into new schools.

6. Maintain data that enable the tracking of achievement by sex, geo-cultural identification, and grade.

7. Incorporate expressed parent interest into action groups which can assist with specific strategies and tasks for increased parent involvement.

APPENDIX A

Oregon state System of Higher Education
Academic Performance Report, New Freshmen, 1985-86

Oregon State System of Higher Education

ACADEMIC PERFORMANCE REPORT

New Freshmen, 1985-86

By ethnic group, the State System and national mean SAT scores were:

State System & National
SAT Scores by Declared Ethnic Group & for All New Freshmen: 1985-86

	SAT	Asian	Black	Hispanic	Native American	White	All New Freshmen
State System							
	V+M	874	761	881	889	945	937
	Math	494	391	464	457	491	489
	Verbal	380	370	417	432	454	448
National							
	V+M	922	722	808	820	936	906
	Math	518	376	426	428	490	475
	Verbal	404	346	382	392	449	431

All minority ethnic groups fell below the systemwide mean SAT combined score for all new freshmen, ranging from Blacks at 176 points under to Native Americans at 48 points below the average. The majority White ethnic group scored 8 points above the State System average.

When national and State System SAT scores by ethnic group are examined, State System new freshmen - except Asians - consistently score to a greater or lesser degree above the national means for their cohorts.

Oregon State System of Higher Education

ACADEMIC PERFORMANCE REPORT

New Freshmen, 1985-86

Freshman Year GPA for All New Freshmen by Ethnic Group and Sex

Group	Asian	Black	Hispanic	Native American	White	Total
All New Freshmen	2.51	2.10	2.25	2.25	2.52	2.51
Men	2.40	1.99	2.29	2.18	2.43	2.42
Women	2.66	2.27	2.19	2.30	2.62	2.60

Again in 1985-86 as in prior years, in reviewing the relationship between SAT-V+M scores, HSGPA, and freshman GPA, it appears that the HSGPA has an overriding influence on the freshman year GPA, regardless of SAT-V+M scores. Asian and White women enter college with the highest high school grade point averages and below average combined SAT-V+M scores, but complete the freshman year with the highest grade averages, over one-tenth of a point above the freshman average of 2.51.

For all State System new freshmen, the entering HSGPA by ethnic group and sex:

Group	Asian	Black	Hispanic	Native American	White	Total
All New Freshmen	3.14	2.67	2.91	2.92	3.12	3.11
Men	3.05	2.62	2.95	2.73	3.02	3.01
Women	3.25	2.75	2.86	3.05	3.21	3.20

Women in general enter college with significantly higher grade point averages than men, on the average almost two-tenths of a grade point higher. By ethnic group, Asians have the highest entering HSGPA, followed by Whites, Native Americans, Hispanics, and Blacks in that order. As compared to all other groups, whether by sex and/or ethnic group, White and Asian women enter college with the best record of academic performance in high school, 3.21 and 3.25 respectively.

APPENDIX B

Portland MESA List:

Speaker Presentations, Technical Site Visits, Special Activities

PORTLAND MESA
Mathematics, Engineering, Science Achievement

A joint program of
Portland Public Schools
District Wide Programs
and Portland State University
School of Engineering & Applied Science

Portland-MESA
Speaker Presentations, Technical Site Visits and Special Activities

School	Date/Activity	
Beaumont Middle School	October 16 -	Marilly Cosner (OMSI) (S)*
	November 13 -	Coopers and Lybrand (TSV)**
	December 11 -	Peggy Noone (Science Hands-on) (S)
	January 15 -	Gail Whitney (Sat. Academy) (S)
	January 29 -	Oregon Graduate Center (TSV)
	February 26 -	Tektronix (TSV)
	March 5 -	Reed College (TSV)
	April 9 -	Russell Smith (Army Corps of Eng.) (S)
Binnsmead Middle School	October 22 -	Larry Philbrick (OMSI) (S)
	November 12 -	Coopers and Lybrand (TSV)
	January 14 -	Nancy Hunt (Sat. Academy) (S)
	February 4 -	Shipyards (S)
	February 11 -	Shipyards (TSV)
	February 25 -	Peggy Noone (Science Hands-on) (S)
	March 4 -	Oregon Graduate Center (TSV)
	April 1 -	Jim Primmer (Columbia Machine) (S)
Fernwood Middle School	November 6 -	Marilly Cosner (OMSI) (S)
	Novmeber 12 -	Portland Airport (TSV)
	January 15 -	Peggy Noone (Science Hands-on) (S)
	February 12 -	Oregon Graduate Center (TSV)
	April 23 -	Joyce MacWilliamson (Tektronix) (S)
	April 30 -	Tektronix (TSV)
Kellogg Middle School	October 23 -	Marillyn Cosner (OMSI) (S)
	October 30 -	Marilee Dolph (Portl of Portland) (S)
	November 6 -	Port of Portland (TSV)
	November 20 -	Franz Rad (PSU Head of Civil Eng.) (S)
	December 18 -	Peggy Noone (Science Hands-on) (S)
	January 15 -	Oregon Graduate Center (TSV)
	February 12 -	TriQuint (TSV)
	February 26 -	Reed College (TSV)
	April 30 -	John Stone (U.S. Navy) (S)
Mt. Tabor Middle School	October 15 -	Larry Philbrick (OMSI) (S)
	November 19 -	Oregon Primate Center (TSV)
	January 21 -	Peggy Noone (Science Hands-on) (S)
	February 25 -	Oregon Graduate Center (TSV)
	March 11 -	Shipyards (S)
	March 18 -	Shipyards (TSV)
	April 8 -	John Stone (U.S. Navy) (S)

Mailing address:
Portland State University, School of Engineering & Applied Science, P.O. Box 751, Portland, Oregon 97207, (503) 229-4665

School	Date/Activity	
Ockley Green Middle Sch.	November 17 -	Julie Cleveland (OMSI) (S)
	November 24 -	Marilee Dolph (Port of Portland) (S)
	December 1 -	Port of Portland (TSV)
	January 12 -	Nancy Hunt (Sat. Academy) (S)
	February 18 -	Oregon Graduate Center (TSV)
	March 11 -	Peggy Noone (Science Hands-on) (S)
Tubman Middle School	October 28 -	Kentrox (TSV)
	November 4 -	Julie Cleveland (OMSI) (S)
	January 13 -	Oregon Graduate Center (TSV)
	March 10 -	Dr. Prophet (PPS) (S)
	March 31 -	Army Corps of Engineers (TSV)
	April 7 -	Oregon Primate Center (TSV)
	May 5 -	Peggy Noone (Science Hands-on) (S)
Whitaker Middle School	November 6 -	Oregon Primate Center (TSV)
	November 13 -	Marillyn Cosner (OMSI) (S)
	January 8 -	Paul Marshall (IBM) (S)
	February 19 -	Oregon Graduate Center (TSV)
	March 12 -	TriQuint (TSV)
	April 2 -	Donna Harris (IBM) (S)
	April 16 -	Oregon Primate Center (TSV)
Benson High School	November 5 -	Larry Philbrick (OMSI) (S)
	November 19 -	Horizon Airlines (TSV)
	January 14 -	Oregon Graduate Center (TSV)
	January 28 -	Tektronix (TSV)
	February 11 -	NCR (TSV)
	March 4 -	Peggy Noone (Science Hands-on) (S)
	April 15 -	Russell Smith (Army Corps of Eng.) (S)
	April 29 -	Donna Harris (IBM) (S)
	May 6 -	Kamau Anderson (Army Corps of Eng) (S)
Grant High School	November 3 -	Larry Philbrick (OMSI) (S)
	November 17 -	Mary Tobias (OR Primate Center) (S)
	November 24 -	Oregon Primate Center (TSV)
	January 26 -	Portland Airport (TSV)
	February 2 -	Peggy Noone (Science Hands-on) (S)
	February 9 -	Paul Marshall (IBM) (S)
	March 2 -	Oregon Graduate Center (TSV)
	April 6 -	Tektronix (TSV)
	April 20 -	Kamau Anderson (Army Corps of Eng) (S)
	May 4 -	Russell Smith (Army Corps of Eng.) (S)
Jefferson High School	October 30 -	Larry Philbrick (OMSI) (S)
	November 6 -	Trevor Smith (PSU) (S)
	November 13 -	Mary Tobias (OR Primate Center) (S)
	November 20 -	Oregon Primate Center (TSV)
	January 15 -	Paul Marshall (IBM) (S)
	February 5 -	Portland Airport (TSV)
	March 5 -	Oregon Graduate Center (TSV)
	April 23 -	Peggy Noone (Science Hands-on) (S)

* (S) Speaker Presentation
**(TSV) Technical Site Visit

NOTE: 1. In addition to the above activities, PSU engineering students visited MESA Chapter Meetings to give instructions and demonstrations on structure building for the Portland-MESA contests.

2. Special Activites for all Chapters:

October 10 -	Site visits with Colamette Construction and the Department of Transportation
November 15 -	PSU Construction Day
December 13 -	PSU Competition Day
December 22 -	Portland-MESA High School Leadership Conference
January 10 -	Newtonian Physics and Dissection Clinics, PSU
January 23 -	Salem/Willamette University, Franz Bakery
February 7 -	Expanding Your Horizons - MESA females
February 27 -	PSU Engineering Open House Contests
February 28 -	Portland-MESA 2nd Annual Family Day, PSU
March 14 -	Advisor's Activity Day, PSU
March 23 & 24	Mentorships - IBM, Tektronix, Reed College, U.S.Bank, Army Corps of Engineers, & the District Attorney's office
March 25 -	Telescope Clinic/Math Workshop
March 26 -	Goldendale Observatory Site Visit
April 3 -	Site Visits - U.S. Bank, Tektronix, Army Corps of Engineers, and Providence Hospital
April 18 -	Computer Day
May 2 -	Aerodynamics Activity Day, PSU
May 8-10	Trip to Seattle, Washington MESA
May 13 -	2nd Annual Portland-MESA Awards Reception

APPENDIX C

Portland MESA Student Contract,
Incentive Award Guidelines, MESA Point System

PORTLAND MESA
Mathematics Engineering Science Achievement

A joint program of
Portland Public Schools
District Wide Programs
and Portland State University
School of Engineering & Applied Science

MESA Contract

The MESA Program offers a variety of services, but students must put something into the Program in order to get something out of it. Therefor , we ask that the students and parents make some minimum commitment to MESA. Please read this contract thoroughly and sign in the appropriate space.

For Students

I,_____, will hereby accept the the following responsibilities as a MESA student:

1. Attend regular weekly meetings, directly after school.
2. Attend study labs as designated by my advisor.
3. Participate in field trips to businesses, educational institutions, and industries at least once per semester.
4. Participate in Saturday workshops at least once per semester.
5. Complete surveys, questionnaires and speaker evaluations which are needed to evaluate and improve the MESA Program.
6. Attend the MESA Summer Enrichment Program or a MESA approved summer program at least once before high school graduation.

High School only:

7. Enroll in academic math, science and English courses each semester.

_____ _____
Student's Signature Date

For Parents:

I,_____, the parent(s) and/or guardian(s) of _____, will accept the following responsibilities as a MESA parent:

1. Encourage my child to participate fully in the Program.
2. Attend at least two MESA activities per year.
3. Attend at least one MESA Parent Meeting per school year.

_____ _____
Parent's Signature Date

Mailing address:
Portland State University, School of Engineering & Applied Science, P.O. Box 751, Portland, Oregon 97207, (503) 229-4665

PORTLAND

Mathematics, Engineering, Science Achievement

A joint program of
Portland Public Schools
District Wide Programs
and Portland State University
School of Engineering & Applied Science

Incentive Award Guidelines

Portland-MESA expects participating MESA students to be model students - that is - abide by school and classroom rules, work diligently in classes and maintain at least an average Grade Point Average (preferably higher.)

To encourage and reward superior achievement in mathematics and science, monetary incentive awards will be provided to students who receive A's and B's in their math and science courses during the 2nd and 3rd grading periods. The guidelines are as follows:

Regular Incentive Awards

Students that have participated in MESA for at least one semester can earn incentive awards if they have fulfilled the following requirements:

1. accumulated the minimum number of participation points as designated by the advisor,
2. earned an A or B in mathematics and/or science, and
3. received no D's or F's in <u>any</u> class.

Award Amounts

Middle Schools	High Schools
A earns $5.00	A earns $7.00
B earns $2.00	B earns $4.00

Maxi Incentive Awards

High school students are eligible for maxi incentive awards if they have...

1. enrolled in at least the third year of mathematics, English, and science, that is chemistry or physics,
2. at least a 3.00 GPA in math, English and science,
3. scored at least 90 on the (P)SAT or 900 on the SAT, and
4. fulfilled all the requirements of the regular incentive awards.

Award Amount

BASIC AWARD For Cumulative GPA and Participation		ADDITIONAL AWARD Combined with (P)SAT	
4.00	$45.00	(120)0	$15.00
3.50	$40.00	(110)0	$10.00
3.00	$35.00	(100)0	$ 5.00

Mailing address:
Portland State University, School of Engineering & Applied Science, P.O. Box 751, Portland, Oregon 97207, (503) 229-4665

PORTLAND
Mathematics, Engineering, Science Achievement
A joint program of
Portland Public Schools
District Wide Programs
and Portland State University
School of Engineering & Applied Science

PORTLAND-MESA POINT SYSTEM

The MESA secretary and/or advisor will record the activity points according to the list below. It is the student's responsibility to make sure his/her points are recorded accurately. All students must have at least 75% of possible points in their Chapter to receive an incentive award in February and in June.

Activity	Points
MESA Meetings	5
Evaluation Forms	5
Special MESA Meetings and Workshops	15
Field Trips on School Holidays	15
MESA Activity Report	10
Special MESA Projects. (i.e. oral reports, MESA Updates, science projects-math projects presented to peers. Must be approved by Advisor.)	15
Study Labs (per session attended)	5
Other - As designated by the Advisor	?
High School Students only:	
(P)SAT Workshops (per session attended)	10

Mailing address:
Portland State University, School of Engineering & Applied Science, P.O. Box 751, Portland, Oregon 97207, (503) 229-4665

APPENDIX D

Percentages of Response
Parent Questionnaire, Student Questionnaire,
Percentages of Change - Student Questionnaire

PERCENTAGES OF RESPONSES: 1986-87

PARENT QUESTIONNAIRE: Mathematics, Engineering, Science Achievement (MESA)

Instructions: Please read each sentence. Look at the four columns to the right. For each statement mark in the box that matches your response.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. MESA program adds brand new opportunities for my child.	43.5	56.5	0.0	0.0
2. Information about MESA is readily available.	4.3	60.9	26.1	8.7
3. My children are glad to be a part of MESA.	52.4	42.9	4.8	0.0
4. MESA specifically helps my child know more about careers.	43.5	34.8	21.7	0.0
5. I encourage my child to participate in MESA.	52.2	39.1	4.3	4.3
6. Encouraging my child is one main reason that he/she continues in MESA.	13.0	43.5	39.1	4.3
7. I am familiar with activities MESA makes available to students.	13.0	65.2	21.7	0.0
8. My child is aware of the benefits offered by MESA.	13.0	73.9	13.0	0.0
9. MESA does a good job of linking students with business people.	8.7	69.6	13.0	8.7
10. MESA is stimulating my child to study more often/regularly.	4.3	43.5	47.8	4.3
11. Most parents attended the MESA Parent Meeting.	5.9	29.4	52.9	11.8
12. I understand the structure of MESA coordinator, advisors, activities, etc.	4.8	47.6	38.1	9.5
13. MESA advisors will call me on the phone if they need me.	0.0	64.7	29.4	5.9
14. My child speaks positively about MESA.	50.0	45.5	4.5	0.0
15. More students should have a chance to participate in MESA.	30.0	65.0	5.0	0.0

0059E (Suggestions or comments on back)

Prepared by Portland Public Schools, Evaluation Dept., 2/3/86

PERCENTAGES OF RESPONSES: 1986-87

Mathematics, Engineering, Science Achievement (MESA)

MESA Student Questionnaire

Instructions: Please read each sentence. Look at the four columns to the right. For each statement mark in the box that matches your response.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. MESA program gives me an advantage that I wouldn't have without it.	20.1	67.8	9.4	2.7
2. MESA makes me more aware of career opportunities than regular school courses.	34.0	53.7	10.2	2.0
3. Mathematics is more interesting after being in MESA.	16.2	48.0	33.8	2.0
4. Science is more interesting after being in MESA.	19.2	52.1	26.0	2.7
5. My friends who are not in MESA wish they were.	12.1	32.6	40.4	14.9
6. Tutoring help is something I really need.	8.3	29.0	43.4	19.3
7. I do have career goals.	61.1	31.5	6.0	1.3
8. I plan to go to college.	77.4	19.9	0.0	2.7
9. The MESA advisor at my school provides helpful instruction.	34.9	54.8	8.2	2.1
10. The weekly classes are less interesting than I first thought they would be.	12.9	34.7	40.8	11.6
11. I think field trips reduce my learning when they are on school time.	10.1	19.6	33.8	36.5
12. I don't mind leaving school for a worthwhile field trip.	56.5	32.7	9.5	1.4
13. I am familiar with several mathematics-based careers.	25.2	53.7	17.7	3.4
14. I am familiar with several science-based careers.	26.1	47.1	22.5	4.3

	Strongly Agree	Agree	Disagree	Strongly Disagree
15. I expect to continue with MESA during all my high school years.	40.6	44.9	10.1	4.3
16. My advisor understands how to get our MESA group to do their best.	28.8	54.7	15.8	0.7
17. I attend all MESA group sessions.	31.7	45.8	21.8	0.7
18. Our MESA group has very good attendance at group sessions.	16.1	50.4	25.5	8.0
19. Our guest speakers add to what the MESA program is trying to teach.	29.5	64.0	5.0	1.4
20. My parents are pleased about my participation in MESA.	53.2	45.3	1.4	0.0
21. I feel well informed about careers as a result of MESA.	26.4	53.6	16.4	3.6
22. Because of MESA I am less worried about taking higher level math and science courses.	19.0	41.6	30.7	8.8
23. MESA students will make good use of the independent study groups.	14.7	59.6	22.8	2.9
24. Weekly sessions focus equally on engineering, math, and science.	17.0	51.1	27.0	5.0
25. One thing that could help me with full participation is more personal counseling.	9.4	22.3	51.1	17.3
26. MESA has given me pride in myself.	22.8	49.3	19.9	8.1
27. My parents are the main reason I'm attending MESA.	14.2	14.2	40.3	31.3

Suggestions or Comments:

0059E

Prepared by Portland Public Schools, Evaluation Dept., 2/3/86

PERCENTAGES OF CHANGE: 1985-86 TO 1986-87

Mathematics, Engineering, Science Achievement (MESA)

MESA Student Questionnaire

Instructions: Please read each sentence. Look at the four columns to the right. For each statement mark in the box that matches your response.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. MESA program gives me an advantage that I wouldn't have without it.	+7.1	-5.0	-3.7	+2.7
2. MESA makes me more aware of career opportunities than regular school courses.	-4.2	+2.4	-0.3	+2.0
3. Mathematics is more interesting after being in MESA.	-1.8	+1.1	+2.8	-2.5
4. Science is more interesting after being in MESA.	-3.1	+7.5	-4.4	-6.2
5. My friends who are not in MESA wish they were.	-2.9	-1.9	+1.5	+3.4
6. Tutoring help is something I really need.	-4.9	+3.3	+8.0	-6.4
7. I do have career goals.	-7.3	+2.7	+4.2	+0.5
8. I plan to go to college.	-6.4	+3.7	0.0	+2.7
9. The MESA advisor at my school provides helpful instruction.	-5.8	-0.9	+5.5	+1.2
10. The weekly classes are less interesting than I first thought they would be.	-0.4	-4.2	+7.2	-2.6
11. I think field trips reduce my learning when they are on school time.	+1.3	+5.6	+5.7	-12.6
12. I don't mind leaving school for a worthwhile field trip.	-2.0	+1.6	-0.9	+1.4
13. I am familiar with several mathematics-based careers.	+2.7	-4.0	-1.2	+2.5
14. I am familiar with several science-based careers.	+0.7	-3.8	+1.4	+1.7

	Strongly Agree	Agree	Disagree	Strongly Disagree
15. I expect to continue with MESA during all my high school years.	+5.2	-0.2	-5.8	+0.7
16. My advisor understands how to get our MESA group to do their best.	+1.7	-9.8	+7.4	+0.7
17. I attend all MESA group sessions.	+7.6	+6.0	-9.7	-3.9
18. Our MESA group has very good attendance at group sessions.	+6.4	-7.9	-5.5	+8.0
19. Our guest speakers add to what the MESA program is trying to teach.	-1.9	+7.8	-7.4	+1.4
20. My parents are pleased about my participation in MESA.	-3.8	+5.1	-1.4	0.0
21. I feel well informed about careers as a result of MESA.	-3.8	-0.6	+3.6	+0.8
22. Because of MESA I am less worried about taking higher level math and science courses.	-2.0	-6.4	+0.7	-2.2
23. MESA students will make good use of the independent study groups.	-0.5	-11.8	+10.4	+2.9
24. Weekly sessions focus equally on engineering, math, and science.	-0.8	-1.2	+4.6	-2.5
25. One thing that could help me with full participation is more personal counseling.	+1.9	-8.5	+7.2	-0.5
26. MESA has given me pride in myself.	-3.9	+6.5	-3.9	+1.4
27. My parents are the main reason I'm attending MESA.	-4.7	-7.5	+3.4	+8.8

Suggestions or Comments:

0059E

Prepared by Portland Public Schools, Evaluation Dept., 2/3/86

APPENDIX E

Roster of MESA School Site Advisors
1986-87

MESA School-Site Advisors
1986-87

School (Location)	Room	Day	Time (Prep Period)	Advisor	Phone (Hm Phone)	Principal
Beaumont (4043 N.E. Fremont)	208	Thursdays	2:40-3:20 (10:11-10:51)	Mr. Eltagonde	280-5610	Thomas Marineau
Binnsmead (225 S.E. 87th)	158 South	Wednesdays	2:40-3:30 (9:30-10:20)	Ms. Gross	280-5700 (245-8240)	Donna Manning
Fernwood (1915 N.E. 33rd)	220A	Thursdays	3:10-3:45 (9:15-10:00)	Ms. Miller	281-0089 (239-5363)	John Ubik
Kellogg (3330 S.E. 69th)	108	Thursdays	3:20-4:15 (9:30-10:20)	Mr. Graham	280-5707	Sue Parker
Mt. Tabor (5800 S.E. Ash)	101	Wednesdays	3:40-4:20 (2:50-3:30)	Ms. Conley	280-5646 (254-7807)	Kenneth Wait
Ockley Green (6031 N. Montana)	115	Mondays	2:45-3:45	Mr. Walden	280-5660 (288-1714)	Patrick Burk
Tubman (2231 N. Flint)	Cafeteria	Tuesdays	3:20-4:20 (9:30-10:14) (11:00-11:39)	Mr. Folk and Mr. Starr	280-5630 (238-1718) (771-6418)	Paul Coakley
Whitaker (5700 N.E. 39th)	207A	Thursdays	3:35-4:05 (11:06-11:46)	Mrs. Cooper and Mrs. Weatherspoon	280-5620 (255-0850) (696-0508)	Don Starr
Benson (546 N.E. 12th)	H116	Wednesdays	3:00 (8:20-9:00)	Ms. Eames	280-5100 (284-1267)	Thomas Parr
Grant (2245 N.E. 36th)	225	Mondays	2:25-3:15 (11:30-12:30)	Mr. Martell	280-5160 (829-7592)	Myra Rose
Jefferson (5210 N. Kerby)	D12	Thursdays	2:35 (7:30-9:15)	Ms. Navi	280-5180 (644-7995)	Nathan Jones